ATOMIC ENERGY newsletter®

A SERVICE FOR INDUSTRY BUSINESS ENGINEERING AND RESEARCH
ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS CO., 1000 SIXTH AVENUE, NEW YORK 18, N. Y.

June 28th, 1955
Vol. 13 ... No. 10

Dear Sir:

A building to house the high-flux Oak Ridge research nuclear reactor will now be built at Oak Ridge National Laboratory by Blount Bros. Construction Co., Montgomery, Ala., under a $2,238,000 contract recently awarded the firm by the USAEC. The award was made on the basis of competitive, lump sum bids opened June 2nd. The contract calls for an air-tight, three story building to house the reactor which was designed to provide irradiation-test facilities for research and development. The Laboratory will furnish design criteria for the facility, and will install the reactor equipment after completion of the building. The McPherson Co., Greenville, S.C., is providing architect-engineering services.

Using new test systems its engineers have devised, in-pile irradiation studies of reactor components are now being offered as a contract service by Nuclear Development Associates, Inc., White Plains, N.Y. The service includes providing necessary instruments to measure and record temperature and radiation; administering and supervising the tests; and making post-irradiation analyses. (Other PRODUCTS & SERVICES, p. 3).

A two-semester program leading to a master's degree in nuclear engineering is now to be offered by the University of California, Berkeley, starting with the Fall semester, 1955. The University's division of mechanical engineering, in cooperation with the radiation laboratory at Berkeley and Livermore, is giving the courses, which will be focused on analysis, design, performance, prediction, and cost of nuclear power systems. Weekly seminars on selected topics in nuclear energy will be an intrinsic part of the program. Speakers will include E. O. Lawrence, E. Teller, and others. Further information may be obtained from Prof. E. D. Howe, Chairman of Mechanical Eng., Berkeley.

An increase in both gross business and net profits has now been shown by Technical Operations, Inc., Arlington, Mass., for the six months ending March 31st, 1955, of the firm's fourth fiscal year, according to F. C. Henriques, president. Mr. Henriques pointed out that the company's research and development contracts, for the U. S. Government, continue to be its main source of revenue. He noted, however, that major endeavors of the firm in the commercial field are gamma ray apparatus for industrial radiography, and therapy plaques for the medical profession--products employing radioactive isotopes. These commercial products are beginning to yield a profit to the company, Mr. Henriques stated, with nearly all the initial research and development expense for them already incurred. (Other FINANCIAL news, p. 2).

New director of the research staff of General Motors Corp. will be L. R. Hafstad, for several years director of the division of reactor development of the USAEC, and since leaving the USAEC, director of the atomic energy division of the Chase Manhattan Bank, New York. Dr. Hafstad will join G.M. later this year.

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ATOMIC ENERGY BUSINESS REPORTS...

AUTOMOBILE MANUFACTURER MAKING NUCLEAR STUDY:- A study of nuclear fuel elements is now to be made by Ford Motor Co., Dearborn, Mich., under the USAEC's participation program for the development of commercial applications of nuclear energy. Ford has allocated $100,000 for the study, one objective of which is to develop ways to mass produce such fuel elements, according to E. S. MacPherson, vice president of engineering for Ford.

TWENTY-ONE U.S. FIRMS TO EXHIBIT PRODUCTS IN GENEVA: Twenty-one U.S. firms are now assembling and packing their commercial exhibits, which shortly will be on display in a private exposition hall in Geneva for the August U.N. conference to be held there on peaceful uses of atomic energy. Companies that will show nuclear instruments include Anton Electronic Laboratories, Inc.; Daystrom Inc., and its subsidiary Weston Electrical Instrument Corp. Metal filters will be shown by Micro Metallic Corp., while Atomic Development Mutual Fund will also display. American Machine & Foundry will show a model of a research reactor; Babcock & Wilcox Co., a panel display based on a nuclear reactor; Foster-Wheeler Corp., a model of a power breeder reactor; General Dynamics Corp., an exhibit based on the submarine Nautilus; High Voltage Engineering Corp., a Van de Graaff machine; Glenn L. Martin Co., a package reactor exhibit; Nuclear Development Associates, a model of a medical research reactor; and Vitro Corp. of America, an exhibit on uranium refining. Other exhibits will be by General Electric Co., Bendix Aviation Corp., Westinghouse Electric Corp., Walter Kidde Nuclear Laboratories, Lycoming Div. of Avco Manufacturing Corp., Minneapolis-Honeywell Regulator Co., and Tracerlab, Inc.

The conference itself will be in the Palais des Nations, approximately four miles from the commercial exhibit hall. (Official scientific exhibits of the participating nations will be shown in the Palais.) Over fifty nations will attend; abstracts of the papers to be presented at the conference have been received by the U.N. from 23 governments and 5 specialized agencies, so far. Scientific and non-political in character, sessions will consider power needs; power supplies in the world; reactors; reactor physics and chemistry; metallurgy; applications of radioisotopes in research and industrial problems; and biological and medical aspects of nuclear radiation.

EXPORT REACTOR SUBSIDY PLAN APPROVED: A fund of $5 million has now been approved by the Joint Congressional Committee on Atomic Energy to enable research reactors and nuclear fuel to be provided by the U.S. to certain foreign countries at one-half their usual sales price. The fund was included in a $267 million bill authorizing the USAEC to build plants and facilities, acquire real estate, and finance other functions which are not part of the USAEC's normal operating expenses, and which the Joint Committee considered last fortnight in Washington.

ATOMIC ENERGY FINANCIAL REPORTS...

INVESTMENT IN URANIUM MILLING FIRM MADE: American Zinc has bought 175,000 shares, or 14.6%, of the common stock of Uranium Reduction Co., H. I. Young, American Zinc president told his stockholders last week in St. Louis. American Zinc will also manage Uranium Reduction, he said. Uranium Reduction was organized to construct a uranium ore processing plant at Moab, Utah. It holds a USAEC contract to sell its entire output of uranium concentrates to the USAEC. The firm will also explore and develop mining claims it owns. Capitalization is $12,120,000 of which $8 million will be for the plant, and the balance for uranium exploration purposes. In addition to American Zinc, the common stock of Uranium Reduction will be owned by Utex Exploration Co.; Foley Bros., Inc., Pleasantville, N.Y.; Kuhn, Loeb & Co.; Combined Metal Reduction Co., Salt Lake City; and private investors. Utex Exploration is the largest stockholder in Uranium Reduction. Other financing of Uranium Reduction is a $6.2 million bond issue to be purchased by the New York Life Insurance Co., and a bank loan from the Chemical Corn Exchange Bank of New York.

NEW INVESTMENT TRUST IN NUCLEAR FIELD: A new mutual fund which will invest in firms active in atomic energy is the Science and Nuclear Fund offered by Science and Nuclear Distributors, Inc., 1500 Walnut St., Philadelphia 2, Pa.

NEW PRODUCTS, PROCESSES & SERVICES...in the nuclear field...

NEW SERVICES: To measure routine exposure to the hands or fingers of people working with or near radioactive materials, or X-ray equipment, finger film badges are now being furnished by this supplier at weekly intervals. At the end of each week, those which have been used are returned for processing and analysis. A complete exposure record is then sent to the user. The badges are small, light, and said to be water resistant. The unit is stated to be compact enough to remain on the finger within a rubber glove, should the use of such a glove be necessary. --R. S. Landauer, Jr., Park Forest, Ill.

NEW PRODUCTS FOR ATOMIC ENERGY INSTALLATIONS: A quantity of selenium rectifier power supplies, which furnish 0-60 volts at 2000 amperes continuously, have recently been supplied by Perkin Engineering Corp., El Segundo, Calif., to an atomic energy facility of the USAEC. The units, developed and manufactured by Perkin, are for an AC input of 480 volts, 60 cycle, 3 phase current.

A cold-setting lead cement mixture, developed at Argonne National Laboratory, Lemont, Ill., has been found by the Laboratory to have shielding properties approximately 1½ times as effective as steel for gamma ray energy up to 1.33 Mev. Used by the Laboratory in applications where it was necessary to construct joints of a high density material, the cement has found other applications where special shapes are required for radiation shielding since it can be cast cold in simple forms of wood or paper board. The density of the lead cement is 515 lb./cu. ft., compared with 707 lb./cu. ft., for cast lead. Composition of the mixture is: lead shot, 3/16" diameter, maximum, ballast type-76% by weight; lead powder, 100 mesh, 17% by weight; cement, expanding type, 5% by weight; and water, 2% by weight.

The first products are now being produced by the Westinghouse Manufacturing Co. plant at Cheswick, Pa., which will put out a broad line of components for nuclear plants. These first products are "canned" motor pumps, specifically designed for nuclear applications. The pumps eliminate packing, stuffing boxes, etc., and circulate highly corrosive and/or radioactive fluids.

ATOMIC PATENT & TRADE-MARK DIGEST...latest grants in this field...

TRADE-MARK GRANTS TO PRIVATE ORGANIZATIONS: Trade-mark number SN-665,421 for the mark DENSILOG was issued June 14, 1955, to the Lane-Wells Co., Los Angeles, Calif. The mark is to cover a service offered by Lane-Wells: radiologically measuring the characteristics of sub-surface strata surrounding earth boreholes.

PATENT GRANTS TO PRIVATE ORGANIZATIONS: Process for the recovery of substantially pure uranium, in the form of uranium peroxide, from impure uranium tetrafluoride. Comprises (in part) dissolving the impure uranium tetrafluoride in excess dilute sulfuric acid in the presence of excess hydrogen peroxide, precipitating ammonium uranate from the solution so formed by adding an excess of acqueous ammonia, dissolving the precipitate in sulfuric acid, and adding hydrogen peroxide to precipitate uranium peroxide. U. S. Pat. No. 2,711,361 issued June 21, 1955, to George O. Morris, Rainhill, near Liverpool, England.

PATENT GRANTS TO GOVERNMENT ORGANIZATIONS: Curium-americium separation and purification process. Comprises (in part) contacting a solution of these elements with a sulfonated polymerizate of a poly-vinyl aryl compound to adsorb them thereon, chromatographically eluting these elements to yield fractions containing enhanced proportions of them, and collecting these fractions. U. S. Pat. No. 2,711,362 issued June 21st, 1955; assigned to United States of America (USAEC). (Inventor: Kenneth Street, Jr., Berkeley, Calif.)

Process of polishing the surface of zirconium metal containing zirconium carbide occlusions. Comprises (in part) immersing the surface into an aqueous solution of about 60 to 85 deg. F., consisting, per one liter of solution, of water, at least 50 grams of a water-soluble fluoride, 350 to 600 cc. of concentrated nitric acid, and from 175 to 400 cc. of a 30% fluosilicic acid. U. S. Pat. No. 2,711,364 issued June 21, 1955; assigned to United States of America (USAEC). (Inventor: John G. Beach, Columbus, Ohio.)

Method of applying adherent electroplates to zirconium surfaces. U. S. Pat. No. 2,711,389 issued June 21, 1955; assigned to United States of America (USAEC). (Inventors: John G. Beach, William C. Schickner, and Charles L. Faust, Columbus, Ohio.)

IMPACT OF NUCLEAR POWER IN THE FUTURE Special condensation, for readers of this LETTER, of remarks by John J. Flaherty, Manager, Chicago Operations Office, USAEC, before American Marketing Assoc., June 15, 1955, in Milwaukee, Wisc.

Why are we interested in nuclear power and its development? Mainly because of the advantages that nuclear power enjoys when compared to the conventional fossil fuels such as coal, oil and gas.

One such important advantage is the compact nature of the fuel itself. This in itself is of overwhelming interest in many power applications. The nuclear powered submarine Nautilus is an example of how we have taken advantage of the compact nature of uranium fuel. It is the reason for the development of similar plants for other naval vessels and merchant ships, and why we are developing small package power units which the Army may locate at remote Arctic bases where transportation of large quantities of coal or oil is difficult.

Another advantage of uranium as a fuel is its cost. A pound of refined uranium costs approximately $20.00, while 1500 tons of coal (to which the one pound of uranium is potentially equivalent in heat) cost approximately $9,000. Considering raw fuel costs alone, uranium thus enjoys a several hundred-fold advantage over coal or other fossil fuels.

A third attractive fact about uranium is that its reserves, on an equivalent energy basis, are generally much larger than those of the fossil fuels. This is of greater interest outside the U.S., since our fossil fuel reserves are estimated to be adequate until the end of the present century.

Counteracting these advantages, it must be realized that at present we are a long way from solving all the problems that must be met before nuclear power plants can even approach an economic competitive situation with the traditional fossil fuel plant. The job of cutting costs so that nuclear plants can compete successfully is one that engineers have yet to accomplish.

Currently, the capital costs of nuclear power plants run two and three times the costs of conventional fossil fuel plants. The resulting production costs of electrical energy are affected in a similar ratio. In the electrical utilities business in the U.S. today, we think of production costs that range from 5 to 8 mills per kilowatt hour. While we have not yet built an atomic energy power plant designed specifically to cut costs to the very minimum, our paper studies most frequently range from 10 to 15 mills per kilowatt hr.

Of course there is every confidence among those in the atomic energy business that our developmental problems will be met rapidly and that we will achieve costs comparable to coal fired plants within a relatively short period of time. When this point is reached, however, further large reductions in cost will be difficult to achieve, since our area of attack will then be quite small. We will then be dealing with only 17% of total electric plant investment, and even if our uranium fuel were free, it could not result in a spectacular reduction in total operating costs. Nuclear power, then, cannot be expected to usher in an era of immense plenty through very cheap electrical energy. (While power is really the main stream of the atomic energy business, it seems that the by-products business is off to a better start than the principal item. We thus find that radioactive isotopes, which are the by-products of the operation of nuclear reactors, are already widely used in industry.)

As to the status of the central station nuclear plants in the U.S. today: Construction will be made by four utilities, so that by 1960 they will have atomic power plants with a total cost of $150 million in operation; the Federal government contribution will be between 10 and 20 percent. These plants would have a total generating capacity of 455,000 kw. Additionally, there is the Consolidated Edison plant (N.Y.) of 250,000 kw., at a capital cost of $55 million, and the Duquesne Power (Pa.) plant of 60,000 kw., to cost $46 million, which are being erected, with the Federal government financing $33 million of the latter. Adding these up gives us 765,000 kilowatts of capacity at a total cost of $251 million, as the present firm building commitment allocated by private concerns to atomic power.

For the future, there are varying predictions as to the installed capacity of nuclear power plants by 1970. Predictions made by "experts" run from 5 to 25 million kilowatts, with nuclear plants by 1970 carrying from 1½ to 6% of the total electrical load in the U.S.

NUCLEAR WORK ABROAD...

GREAT BRITAIN:-Six nuclear reactors designed to produce materials for nuclear weapons, as well as heat for generating electrical energy, will now be built in Britain, Geoffrey Lloyd, Minister of Fuel, told the House of Commons in London last fortnight. (The reactors will be in addition to Britain's $840,000,000 atomic energy program announced last February under which twelve nuclear power reactors will be constructed, in a period of years.) Two of the new reactors announced by Mr. Lloyd will be at Calder Hall and the other four accessible to the uranium processing plant at Winscale, Cumberland.

A British Nuclear Energy Conference has now been formed in England by the Institutions of Civil, Mechanical, Electrical and Chemical Engineers, and the Institute of Physics. It is an effort to enable scientists and engineers to mutually discuss problems involved in nuclear technology. The Conference will be managed by a board consisting of three representatives from each of the five societies; first meeting will be in the Fall of 1955 when a symposium of lectures will be given on the technology of nuclear energy. Chairman of the Conference is Sir Christopher Hinton, while Sir John Cockcroft is a board member.

Nuclear radiation used in sterilizing foods and other materials ingested by humans may possibly induce cancerous reactions, according to a report released in London last fortnight. The report summarized investigations conducted by R. S. Hannan, of Cambridge University, for the Department of Scientific and Industrial Research (D.S.I.R.). The report said the danger is not in actual radioactivity in the irradiated foods, but rather from the chemical changes induced by the irradiation. It is not known, the report said, whether the cancer-producing effect would be transmitted to the consumer of irradiated foods by such chemical changes.

MEETINGS & CONFERENCES...on nuclear subjects...

AMERICAN SOCIETY OF MECHANICAL ENGINEERS:-The first detailed description of a package nuclear power reactor to be built by American Locomotive Co., for the U.S. Army, was given to the ASME last week in Boston. Describing the installation were A. L. Boch, project engineer, and R. S. Livingston, director, of the electronuclear research division of Oak Ridge National Laboratory, Oak Ridge. (Cost of the reactor will be $2,096,753, with net electric output of 1,000 kw., and net steam heat output of 5,500 kw.) Complete paper by Boch and Livingston, no. 55-SA-71, may be obtained from the ASME, 29 W. 39th St., New York 18, at 50¢.

RADIOACTIVITY APPLICATIONS SYMPOSIUM: A three day symposium on Applications of Radioactivity in the Food and Processing Industries is now to be held Oct. 19th-21st, 1955, in Boston, under the sponsorship of Tracerlab, Inc., Boston nuclear products manufacturer and processor. It is the second in a series of such symposia which Tracerlab is sponsoring. Primary objective of the October symposium, Tracerlab states, is to acquaint members of the food and processing industries with the past uses, and possible future applications, of radioisotopes in research, development and process control.

RAW MATERIALS...prospecting, mining & marketing...

UNITED STATES:-Vitro Minerals Co. (div. of Vitro Corp. of America) is now exploring 5,500 acres of land in Johnson County, Wyo., for uranium minerals. The company is also mining on the Stateco lease in the Gas Hills district of Fremont, Wyo., and is drilling on 30 claims in the Indian Creek district of San Juan County, Utah..... Federal Uranium of Nevada says it estimates "high grade" uranium ore reserves on its Radon group of claims at 284,000 tons. The properties, in the Big Indian area of San Juan County, Utah, had been core drilled, in some cases down to 700-ft., to obtain this estimate, the firm advises.

CANADA:-The feasibility of bringing into production its Birch Island uranium property, near Kamloops, B.C., is now being considered by Rexspar Uranium and Metals Mining Co., company officials state. The company feels that it has outlined 1,000,000 tons with a grade calculated at 1.75 lbs. of uranium oxide per ton.

Sincerely,

The Staff,
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